

WHAT IS CLAIMED IS:

1. A method for evaluating the ability of a compound to inhibit the protoporphyrinogen oxidase activity, which comprises the steps of:

(1) culturing a transformant expressing a protoporphyrinogen oxidase gene present in a DNA fragment in a medium containing substantially no protoheme compounds in each comparative system of the presence and absence of a test compound to measure a growth rate of the transformant under each condition, said transformant ^{resulting} being resulted from a host cell deficient in the growing ability based on the protoporphyrinogen oxidase activity transformed with the DNA fragment in which a promoter functionable in the host cell and a protoporphyrinogen oxidase gene are operatively linked, and

(2) determining the ability of the compound to inhibit the protoporphyrinogen oxidase activity by comparing the growth rates.

2. A method for evaluating the ability of a compound to inhibit the protoporphyrinogen oxidase activity, which comprises the steps of:

(1) culturing a transformant expressing a protoporphyrinogen oxidase gene present in a DNA fragment in a medium containing substantially no protoheme compounds in each comparative system of the presence and absence of a test compound to measure a growth rate of the transformant under each condition, said transformant being resulted from a host cell deficient in the growing ability based on the protoporphyrinogen oxidase activity transformed with the DNA fragment in which a promoter functionable in the host cell, a protoporphyrinogen oxidase gene and a terminator functionable in the host cell are operatively linked, and

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(2) determining the ability of the compound to inhibit the protoporphyrinogen oxidase activity by comparing the growth rates.

3. A method for evaluating the ability of a compound to inhibit the protoporphyrinogen oxidase activity, which comprises the steps of:

(1) culturing a transformant expressing a protoporphyrinogen oxidase gene present in the following (a) DNA fragment in a medium containing substantially no protoheme compounds in each comparative system of the presence or absence of a test compound to measure a growth rate of the transformant under each condition, said transformant being resulted from a host cell deficient in the growing ability based on protoporphyrinogen oxidase activity transformed with

(a) the DNA fragment in which a promoter functionable in the host cell and controllable in its transcriptional activity, and a protoporphyrinogen oxidase gene are operatively linked, and (b) a DNA fragment in which a gene being capable of controlling the transcriptional activity of the promoter in the above DNA fragment and a promoter having the transcriptional activity not controllable by the gene and functionable in the host cell are operatively linked, and

(2) determining the ability of the compound to inhibit the protoporphyrinogen oxidase activity by comparing the growth rates.

4. A method for evaluating the ability of a compound to inhibit the protoporphyrinogen oxidase activity, which comprises the steps of:

(1) culturing a transformant expressing a protoporphyrinogen oxidase gene present in the following (a) DNA fragment in a medium containing substantially no protoheme compounds in each comparative system of the presence and absence of a test

compound to measure a growth rate of the transformant under each condition, said transformant being resulted from a host cell deficient in the growing ability based on the protoporphyrinogen oxidase activity transformed with

(a) the DNA fragment in which a promoter functionable in the host cell and controllable in its transcriptional activity, a protoporphyrinogen oxidase gene and a terminator functionable in the host cell are operatively linked, and

(b) a DNA fragment in which a gene being capable of controlling the transcriptional activity of the promoter in the above DNA fragment, a promoter having the transcriptional activity not controllable by the gene and functionable in the host cell, and a terminator functionable in the host cell are operatively linked, and

(2) determining the ability of the compound to inhibit the protoporphyrinogen oxidase activity by comparing the growth rates.

5. The method according to claim 1 or 3, which is characterized in that the protoporphyrinogen oxidase gene is a protoporphyrinogen oxidase gene derived from an animal or a plant.

6. The method according to claim 1 or 3, which is characterized in that the protoporphyrinogen oxidase gene is a protoporphyrinogen oxidase gene derived from a rat or *Chlamydomonas reinhardtii*.

7. The method according to claim 1 or 3, which is characterized in that the host cell is a microorganism.

8. A rat-derived gene encoding a protein having the protoporphyrinogen oxidase activity.

9. A protoporphyrinogen oxidase gene encoding a protein having the amino acid sequence shown by SEQ ID: No.1.
10. A gene encoding a protein having the protoporphyrinogen oxidase activity and having the amino acid sequence in which one or several amino acids are deleted, substituted, modified or added in the amino acid sequence shown by SEQ ID: No.1.
11. A protoporphyrinogen oxidase gene having the nucleotide sequence encoding the amino acid sequence shown by SEQ ID: No.1.
12. A protoporphyrinogen oxidase gene having the nucleotide sequence shown by SEQ ID: No.2.
13. A DNA fragment having a partial nucleotide sequence of the protoporphyrinogen oxidase gene of any one of claims 8 to 12.
14. A vector which comprises containing the protoporphyrinogen oxidase gene of any one of claims 8 to 12.
15. A transformant which is characterized in that the vector of claim 14 is introduced into a host cell.
16. The transformant according to claim 15, wherein the host cell is a microorganism.
17. The transformant according to claim 15, wherein the host cell is a plant.
18. A *Chlamydomonas reinhardtii*-derived gene encoding a protein having the protoporphyrinogen oxidase activity.
19. A protoporphyrinogen oxidase gene encoding a protein having the amino acid sequence shown by SEQ ID: No.9.

20. A gene encoding a protein having the protoporphyrinogen oxidase activity and having the amino acid sequence in which one or several amino acids are deleted, substituted, modified or added in the amino acid sequence shown by SEQ ID: No.9.

21. A protoporphyrinogen oxidase gene having the nucleotide sequence encoding the amino acid sequence shown by SEQ ID: No.9.

22. A protoporphyrinogen oxidase gene having the nucleotide sequence shown by
SEQ ID: No.10.

23. A DNA fragment having a partial nucleotide sequence of the protoporphyrinogen oxidase gene of any one of claims 18 to 22.

24. A vector which comprises the protoporphyrinogen oxidase gene of any one of claims 18 to 22.

25. A transformant which is characterized in that the vector of claim 24 is introduced in a host cell.

26. The transformant according to claim 25, wherein the host cell is a microorganism.

27. The transformant according to claim 25, wherein the host cell is a plant.

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